Project Bi- Weekly Progress
Date: 10-29 -13

Project Title: Solar Powered Arc Jet Thruster
Students Names: Chris Brolin, Cory Gainus, Gerard Melanson, Tara Newton Griffin Valentich, Shane Warner

Mentors/ Coordinator/ Sponsor: **Dr. Guo, Dr. Kwan, Dr. Andrei, Kurt Polzin, NASA**

1. Project Title: Solar Powered Arc Jet Thruster

2. Project Objectives/tasks Breakdown:
Design, build, and test a direct drive arc jet thruster for purposes of providing propulsion under vacuum.

Design and execute a test plan to systematically quantify the range of operating conditions over which gas ionization can be achieved.

Perform tests to see if a continuous discharge at these power/current levels can be sustained, and quantify if possible

3. What was accomplished the last two weeks on individual tasks- representative supporting data/ documents

Design concept for the circuit, magnets, and thruster was selected.
Midterm I presentation and report was completed and submitted
Concept of thruster was developed in Creo - Griffin
-dimensions need to be changed to account for available stock

Standard materials were researched on McMaster Carr – Chris, Cory, Gerard, Shane

Budget was investigated and found to be insufficient – all

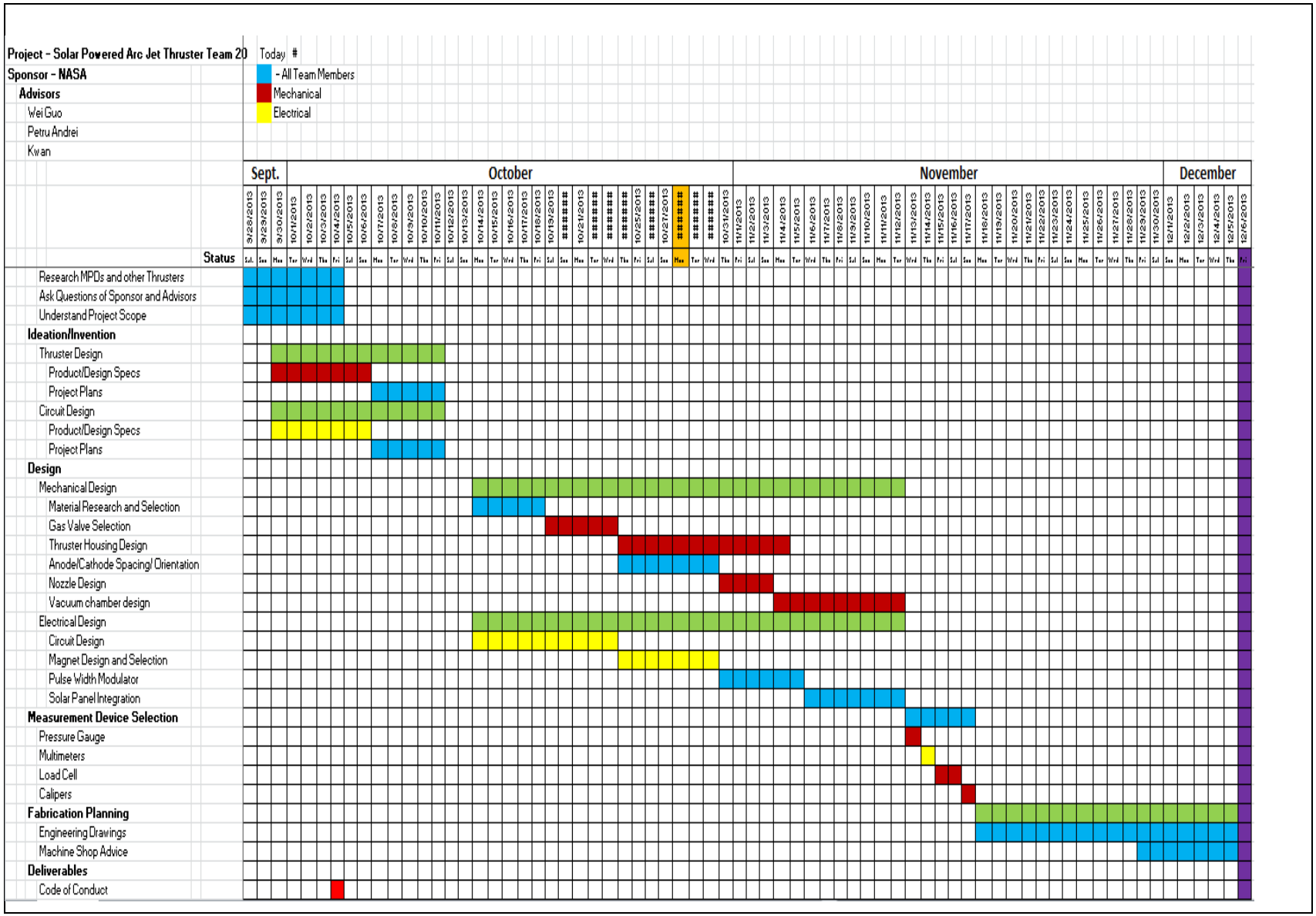
4. Summary of problems encountered and actions taken (and by whom)

Timing of presentation and due date of report
-all worked together and contributed to produce a quality report and presentation
-Shane submitted report and finalized formatting

Problems were realized with lack of funding for project
-Vacuum chamber is very expensive to purchase or fabricate
-Chris Brolin took action and started to record the costs of necessary materials and formatted it into a report along with Midterm I report
- Discovered necessary budget is more than 2x our allotted budget
-Requesting more money from EE senior design side

Selection of dimensions
-Cory preformed Matlab calculations to give us a range of dimensions and the given pressures at those measurements

5. Attached Gantt chart modifications and analysis if project is behind schedule and summarize actions planned to overcome the problems)


Project – Solar Powered Arc Jet Thruster Team 20
Today: #
Sponsor – NASA
- All Team Members
Advisors
Mechanical
Wei Guo
Electrical
Petru Andrei
Kwan
Sept.
October
November
December
Status
Research MPDs and other Thrusters
Ask Questions of Sponsor and Advisors
Understand Project Scope
Ideation/Invention
Thruster Design
Product/Design Specs
Project Plans
Circuit Design
Product/Design Specs
Project Plans
Design
Mechanical Design
Material Research and Selection
Gas Valve Selection
Thruster Housing Design
Anode/Cathode Spacing/ Orientation
Nozzle Design
Vacuum chamber design
Electrical Design
Circuit Design
Magnet Design and Selection
Pulse Width Modulator
Solar Panel Integration
Measurement Device Selection
Pressure Gauge
Multimeters
Load Cell
Calipers
Fabrication Planning
Engineering Drawings
Machine Shop Advice
Deliverables
Code of Conduct

6. Work planned for the next period and the person(s) responsible:

Build prototype circuit and test the voltage spike it is capable of achieving – Gerard, Shane

Complete Thruster design and finalize stock to be selected – Griffin, Cory, Tara, Chris
-make thruster design in Pro E machine able and correct dimensions
-include how to complete circuit and insulation material
-adjustability and part replace ability is important

Decide if economical to buy or build Vacuum chamber – all ME

Select measurement devices – Cory, Chris
-mass flow meter
-pressure sensors
-Spring gauge
-video recording

Select magnets and spacing for anode / cathode

7. Open comments/suggestions (Please feel free to include your private comments):

Budget of $500 is a concern since we need to test under vacuum. Addition funding is requested

Coordinator/ Instructor assessment report and corrective action